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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER LOEWE, ROBERT S				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/591,609

**Applicant(s)**

MEYER ET AL.

**Examiner**

ROBERT LOEWE

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's amendments, filed on 6/30/09, have been fully considered. Applicants traverse the 103(a) rejections of Barthel et al. in view of Nargiello et al. Applicants amendments coupled with further consideration of the references has caused alteration of this rejection. Specifically, Barthel et al. is now believed to anticipate claims 1-4, 7 and 8 as shown in the rejection below. The previously relied upon 103(a) rejection of Barthel et al. in view of Nargiello et al. is withdrawn.

The previous position taken by the Examiner that the surface-treated/silylated silica as taught by Barthel et al. would not necessarily possess DPB values which satisfy the limitation of instant claim 1 is withdrawn. Specifically, paragraph 0041 of the instant specification shows the process in which the silica is treated with the surface-modifying agents. Paragraph 0041 only teaches that the conditioned material is structurally modified with a ball mill (and further post-grinding, if necessary). Examples 1, 6 and 7 do not undergo any post-grinding steps (only structural modification using a ball mill). Table 1 of the instant specification clearly shows that the DBP absorption value falls well below that which is claimed. Barthel et al. clearly teaches that grinding using a ball mill is particularly preferred. Since, Barthel et al. clearly teaches the same process which is exemplified by the Applicants in the instant specification, it is the position of the Examiner that the DPB absorption values of the surface-treated/silylated silica as taught by Barthel et al. would inherently satisfy the DPB absorption values as claimed.

Upon further inspection of Barthel et al., it is believed that Barthel et al. does not teach the limitations of instant claims 5 and 6; that is, after mechanical action and recovery of the

silica, Barthel et al. does not teach or suggest post-grinding and conditioning (heat-treating) step(s). Should Applicants incorporate the limitations of claim 5 are incorporated into claim 2, the Barthel et al. rejection would be overcome. However, the Examiner suggests that the limitation "conditioning" in instant claim 5 be replaced with --heat treatment step-- to add clarity to the claimed process and to further remove the teachings of Barthel et al. as a valid prior art reference for the instant claims. This suggestion is also in light of the proposed amendment given below.

The previously relied upon 103(a) rejection of Hartmann et al. (US Pat. 5,959,005) in view of Fitzgerald et al. (US Pat. 5,623,028) is wholly maintained. Applicants argue that neither Hartmann et al. nor Fitzgerald et al. teach or suggest tear resistance imparted to silicone rubber through the use of fillers. It should be noted that Hartmann et al. explicitly teaches silicone rubber formulations using the surface-treated silica (said surface-treated silica having been prepared in the manner of instant claim 2). Hartmann et al. explicitly teaches a tear strength (which is the same as tear resistance) of 14.0 N/mm. This value is similar to those values obtained in Table 5 of Applicants specification. Applicants argue that the teachings presented in Fitzgerald et al., namely, that the presence of vinyl-groups on the silica would increase the level of interaction between the silica and polymer matrix, would not necessarily give rise to tear resistance. However, the data shown by Hartmann et al. and Applicants specification show comparable tear resistance when employing hexamethyldisilazane as surface-treating agent, and those surface-treating agents which carry a vinyl functional group, such as those exemplified in the instant specification. The Examiner notes Applicants argument that tear resistance is not just dependent on the presence of vinyl groups on the surface of the silica. Specifically, it is noted by

the Examiner that the tear resistance can be altered as shown in Table 5 of the instant specification depending on the process conditions. Specifically, example 3 has a much higher tear resistance than those of examples 7 and 11. The only discernable difference appears to be the post-grinding and heat-treatment steps which are employed for example 3. However, such post-grinding **and** heat-treatment step after post-grinding are not features which are claimed. Instant claims 4 and 5 claim that the silica is subjected to a post-grinding and conditioning step. This limitation is clearly met by Hartmann et al. (1:36-39).

The Examiner recognizes the marked improvement in tear-resistance shown by example 3 in Table 5 of the instant specification. The key difference appears to be that the silica of example 3 was subjected to **both** a post-grinding and heat-treatment step after post-grinding. It is believed that Applicants could overcome the 103(a) rejection of Hartmann et al. in view of Fitzgerald et al. if instant claim 2 was amended to include a step (e) (post-grinding step) and a step (f) (a heat treatment step after post-grinding). While Hartmann et al. is believed to teach steps (a)-(d) of instant claim 2 as well as a post-grinding step, Hartmann et al. does not teach a heat-treatment step after post-grinding. Further, Applicants have shown that this step gives a marked improvement in the tear resistance of the surface-treated silica, which is believed to be an unexpected result.

However, should Applicants overcome the prior art rejections above regarding process claims 2-6 and 8, product claims 1 and 7 would still be rejected using the prior art of record since it is believed that the prior art rejections either anticipate or render obvious all of the physical property limitations of the product. Product-by-process claims are based on the patentability of the product and not on its method of production.

The Examiner understands Applicants desire for an in-person or telephonic interview on the merits of this case. In lieu of an interview at this time, the Examiner believes that this response gives Applicants an opportunity to overcome the prior art of record. The Examiner would be happy to discuss the merits of this case once Applicants have received this response. It is believed that discussing the outstanding merits of this case at that time would expedite the resolution of any remaining issues.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 7 and 8 are rejected under 35 U.S.C. 102(b) as being unpatentable over Barthel et al. (US application 2003/0138715).

Claims 2 and 4: Barthel et al. teaches a process for producing silanized, structurally modified silica. The first step taught by Barthel et al. is a loading step (paragraphs 0050-0057). In the loading step, Barthel et al. teaches (and exemplifies) that the silylating agents are preferably added by means of nozzle techniques such as spraying or atomizing (paragraph 0052). Such a teaching clearly satisfies the limitation from step (a) of claim 2 that the silylating agent/surface-modifying agent is added in either vapor or spray form. It is the position of the examiner that atomization techniques are techniques which the surface-modifying agent is introduced in vapor form. One definition of vapor as defined by Merriam-Webster is "diffused matter (as smoke or fog) suspended floating in the air and impairing its transparency". While vapor is also defined as a material in its gaseous state, one could reasonably apply the first

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definition cited above; therefore Barthel et al. anticipates the limitations of step (a) of instant claims 1 and 4. The second step taught by Barthel et al. is the reacting step (paragraphs 0058-0060). Barthel et al. explicitly teaches that the reacting step of the silylating agent with silica takes place at elevated temperatures (paragraph 0059); therefore, Barthel et al. clearly meets the limitation of step (a) of claim 2. The third step taught by Barthel et al. is a purification process (paragraphs 0061-0066). Barthel et al. teaches that the purification step requires agitation of the surface-treated/silylated silica (paragraph 0062) and additionally, teaches that during the silylation process or following the purification mechanical compaction of the silica may be performed using grinding equipment such as ball mills and pinned-disk mills (paragraphs 0062 and 0064). The milling processes taught by Barthel et al. destructure the silica. Such a destructuring process would satisfy the limitation "to form low structured, pyrogenic silica". Preferably, Barthel et al. teaches that the mechanical compaction is carried out following purification (paragraph 0064). The last step [step (d) of claim 2] is inherent to Barthel et al. as well since the final surface-treated silicas are analyzed (this inherently requires a recovery step).

Regarding the surface-treatment agent, Barthel et al. teaches that suitable silylating agents include vinylalkoxysilanes and alkylalkoxysilanes (paragraph 0039). Specifically, Barthel et al. teaches that suitable silanes include vinyltrimethylchlorosilane and divinyltetramethyldisilazane (paragraph 0039). Both of these species of silanes would inherently yield silanized silica having **both** vinylsilyl groups and methylsilyl groups are required by instant claim 2.

Claim 1: Barthel et al. teaches surface-treated silica having a BET surface area of 25 to 500 m<sup>2</sup>/g (paragraph 0123), an average particle size of 5-100 nm (paragraphs 0077 and 120), and

a carbon content of 1.7-5.4% (Table 1-1). Barthel et al. further teaches that the starting silica has, for example, a pH of 4.1 (paragraph 0183). All of these ranges either fall squarely within the claimed ranges or closely mirror the claimed ranges. Barthel et al. does not teach the DPB value. However, Since Barthel et al. explicitly teaches the four process steps of claim 2 as described above, it inherently follows that the surface-treated silica taught by Barthel et al. would inherently possess the physical property limitations of instant claim 1.

Claim 3: Barthel et al. further teaches that the silica can be first sprayed with water and then with the surface-modifying agent (paragraph 0185).

Claim 7: Barthel et al. further teaches that the silicone rubber can be used as fillers (paragraph 0180).

Claim 8: Barthel et al. further teaches that prior to the heat-treatment step, a mixing step can be performed (residence time of 2.5 hours at 25 °C as taught in paragraph 0187).

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later



invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartmann et al. (US Pat. 5,959,005) in view of Fitzgerald et al. (US Pat. 5,623,028).

Hartmann et al. teaches silanized silica which is prepared according to the instant claims and further possesses all of the claimed physicochemical properties of instant claim 1 (reference in its entirety). Hartmann et al. teaches that the silanization agent is hexamethyldisilazane (1:45-46). Hartmann et al. does not explicitly teach that the silanization agent may possess vinylsilyl groups. However, Fitzgerald et al. teaches silicone rubber compositions which may be filled with silica fillers which are treated with a silanization agent possessing vinylsilyl groups, such as tetramethyldivinylsilazane (7:16). Hartmann et al. and Fitzgerald et al. are combinable because they are from the same field of endeavor, namely, silica fillers treated with hydrophobic silanization agents which may be used as fillers for addition curable polysiloxane compositions. At the time of the invention, a person having ordinary skill in the art would have found it obvious to utilize a silanization agent which possesses a vinylsilyl group as taught by Fitzgerald et al. in the preparation of the silica taught by Hartmann et al. and would have been motivated to do so since Fitzgerald et al. teaches that modification of silica surfaces with vinyl functional groups results in fillers which are capable of reacting with the polymer matrix allows which adjusts the physical properties of the addition-curable polysiloxane compositions allowing for improvement in physical properties or maintaining the same physical properties with less filler (3:59-64, 5:49-57 and 7:12-22).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Loewe whose telephone number is (571)270-3298. The examiner can normally be reached on Monday through Friday from 5:30 AM to 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. L./

Examiner, Art Unit 1796

8-Sep-09

/Randy Gulakowski/

Supervisory Patent Examiner, Art Unit 1796